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Cytochrome oxidase of isolated plastids. N. M. Serebrennikov and I. I. Filippovich. *Doklady Akad. Nauk SSSR* 67, 517-520 (1940). — Plastids (and to lesser extent other structural elements) from leaves of grapes, cabbage, tomato, geranium and potato, carrot and geranium roots contain cytochrome oxidase, which is tightly bound to the lipoproteins and acts only in the oxidized state; vegetative hybridization leads to drastic changes of its activity and the results are inheritable. The nature of the enzyme is confirmed by KCN and NaN<sub>3</sub> inhibition. G. M. Kosolapoff

Inst. Biochem. Im. A. N. Bakh, Acad. Sci. - 1949.

ASAC-SLA METALLURGICAL LITERATURE CLASSIFICATION

STONY STRONG

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SISAKYAN, N. K.

PA 3/50T15

USSR/Chemistry - Plastids  
Chloroplasts

1 Aug 49

"The Phosphoglucanase Activity of Plastids,"  
N. M. Sisakyan, A. M. Kobaykova, Inst of Biochem  
iment A. N. Bakh, Acad Sci USSR, 32 pp

"Dok Ak Nauk SSSR" Vol LXVII, No 4

Experiments described show that, in phosphorolysis  
of starch by phosphorylase preparations of chloro-  
plasts, there is a noticeable accumulation of  
organic substance containing phosphors which are  
hard to hydrolyze. This substance has properties  
of glucose-6-phosphate. Presence of active

3/50T15

USSR/Chemistry - Plastids (Contd)

1 Aug 49

phosphoglucanase in isolated chloroplasts is  
basis for assuming that glucose-1-phosphate  
formed in phosphorylating starch is converted into  
glucose-6-phosphate by action of phosphoglucan-  
tase present in chloroplasts. Submitted by  
Acad A. I. Operin 10 May 49.

3/50T15

SISAKYAN, N. M.

"Against Reactionary Mendelism and Morganism" Collection of Articles edited by:  
M. B. Mitin, N. I. Nuzhdin, A. I. Onarin, N. M. Sisakyan, V. N. Stoletov.  
Publishing House of the Akad. Nauk, USSR, Moscow-Leningrad, 1950, 350 pp.  
Rev. by M. F. Nikitenko.

S0: Progress of Contemporary Biology, Vol. 32, 1951, No. 3 (6)

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Enzyme functions of plastids. Uspekhi Biol.Khim. 1, 372-89 '50.  
(CA 47 no.14:7008 '53) (MLRA 5:8)

SISAKYAN, N.M., professor.

Foreword. Biokhim.vin. no.3:3-6 '50. (MLRA 7:10)  
(Wine and wine making)

SISAKYAN, N.M.; YEGOROV, I.A.; SAAKYAN, R.G.

Intensity of biochemical reactions in the sherry process. Biokhim.  
vin. no.3:57-68 '50. (MLRA 7:10)

1. Institut biokhimii imeni A.N.Bakha. 2. Institut vinodeliya i  
vinogradarstva AN Armyanskoy SSR.  
(Sherry)

SISAKYAN, N. M.

Amino-acid composition of grape wines. N. M. Sisakyan and E. N. Bezinger. *Biokhim. Vinotestya, Akad. Nauk S.S.S.R., Sbornik 3*, 85-86(1980).—Two 3-year-old white wines of Kakheti, Georgia, contain 200-300 mg. total N/l., 1% being protein N, 17-39% polypeptide N, and 45% amino N, whereas the percentage of amino N in 25-43-year-old wines is only 35% of total N. Generally, the amino-N content is lower than that of total free amino-acid N, thus indicating the presence of amino acids with no free amino groups. Application of partition paper chromatography showed the presence of a relatively large amt. (not quant.) of proline. The presence of 8 other amino acids was also detected (C.A. 45, 7745b). 21 references.

E. Wierbicki

Tryptophan and vitamins of the group B in grape wines. MD  
N. M. Sisakyan, I. A. Egorov, and M. G. Puchkova.  
*Biotekhn. Vinodeliya, Akad. Nauk S.S.S.R., Sbornik 3,*  
98-101(1950).—Nicotinic acid, 400-1800  $\gamma$ /l., was found  
in all 36 different wines investigated, while thiamine was  
2.5-27.2  $\gamma$ /l., and riboflavin 1.7-12.5  $\gamma$ /l., in only 22 and  
23 samples, resp. The tryptophan content (detd. by  
*Lactobacillus aralinus*) varied from traces to 6.4  $\gamma$ /l.  
However, no tryptophan could be detected when partition  
paper chromatography was applied (cf. preceding abstr.).  
The nutritional value of wine is pointed out. E. W.

(2)



CA

110

The inheritance of acquired enzymic characteristics of hard wheat which had been transformed into soft wheat. N. M. Sisakyan, V. K. Karapetyan, and N. A. Vasil'eva (Bach-Biochem. Inst., Moscow). *Biohimiya* 15, 9-13 (1950).—In biochem. properties, hard wheat differs from soft wheat in that the former possesses a greater dehydrogenase and  $\beta$ -amylase activity. Contrary to the teachings of Mendel and Morgan, hard wheat can be transformed into soft wheat by planting in an autumn-winter environment (*Agrobiologiya* 4, 5 (1948)). Such soft wheat then also contains a lower dehydrogenase and  $\beta$ -amylase activity than the parent hard wheat. These acquired weaker enzymic characteristics are passed on to future generations. H. Priestley

Inst. of Biochem. in A. N. Bakht, Academy of Sciences, Inst. of Genetics Academy

CA

2

Chemical investigation of plants in the eighteenth  
century in Russia. A. I. Oparin, N. M. Shadrin, and  
N. S. Gel'man. *Biokhimiya* 19, 201-6(1980).—Histori-  
cal. H. Priestley

CH

110

**Nature of amino acid action on the synthesis of sucrose in the living plant cell.** N. M. Sinakyan, N. A. Vasil'eva, and T. V. Stepanova (Rokh-Biochem. Inst., Moscow). *Biokhimiya* 15, 394-400(1950); cf. *C.A.* 41, 6833c.—Leaves of 7-day-old wheat seedlings were vacuum infiltrated by the amino acid and invert sugar. The following amino acids activated the synthesis of sucrose: glycine,  $\beta$ -alanine, tryptophan, cysteine, and glutamic acid. Sucrose synthesis was retarded by serine, cystine,  $\alpha$ -phenylalanine, histidine, methionine, aspartic acid, and arginine. The following amino acids were without effect on sucrose synthesis: valine, leucine, norleucine, isoleucine, and lysine. Those amino acids which increased sucrose synthesis also increased the adsorption of invertase by the plant tissue and raised the intensity of plant respiration. Amino acids which inhibited sucrose synthesis decreased invertase adsorption and were without effect on the plant respiration. Other substances besides amino acids were also tested for their action on respiration and sucrose synthesis. Extremely small amts. of thiamine increased respiration by 25%, and synthesis by 75%. Such an inhibitor of respiration as KCN was without effect on the retardation of sucrose synthesis. Na diethylthiourea, the specific inhibitor of polyphenoloxidase activity, was also without effect on the inhibition of sucrose synthesis.  $AgNO_3$ , the inhibitor of flavoprotein enzyme systems, completely checked the synthesis of sucrose. H. P.

The inst. of Biochem. in A. N. Bakh, Academy of Sciences, USSR,  
Moscow

SISAKYAN, N. M.

Chemical Abstracts  
Vol. 48 No. 5  
Mar. 10, 1954  
Biological Chemistry

*reject*

The nature of the action of amino acids on sucrose synthesis in the living plant cell. N. M. Sisakyan, N. A. Vasil'evskii, and T. V. Stepanova (Acad. Sci. U.S.S.R., Moscow) *Ukrain. Biokhim Zhur.* 22, 471-80 (1950) (in Russian); cf. C.A. 45, 1652d. — In the leaf blades of 7-day-old germinated wheat, enzymic sucrose formation and the adsorbability of invertase were detd. by the method of Kurnenov (C.A. 41, 501h), and respiration was studied in a Warburg app. For study of enzymic synthesis the amino acids were simultaneously introduced with invert sugar soln. by vacuum infiltration into the plant tissues. For study of their action upon adsorption or respiration, an aq. solution of the amino acids was introduced by vacuum infiltration. Sucrose synthesis is activated by glycine, alanine, L- and DL-tryptophan, L-cysteine, DL- $\alpha$ -glutamic acid; it is inhibited by DL-serine, L-cystine, DL-phenylalanine, DL-histidine, DL-methionine, DL-aspartic acid, and DL-arginine; no effect upon sucrose synthesis is shown by DL-valine, L- and DL-leucine, DL-norleucine, DL-isoleucine and DL-lysine. The introduction of amino acids into plant tissues incites complementary respiration, which serves as a source of indispensable energy for synthetic reactions and for adsorption of enzymes. The adsorption of enzymes, e.g. invertase, leads to addnl. enzymic sucrose formation as the result of removal of hydrolyzing agents from the medium. Thiamine increases respiration by 25% and sucrose synthesis by 75%; KCN (a respiration inhibitor) and compds. of heavy metals (depressors of the respiratory system), and sodium diethylthiourea (which inhibits polyphenoloxidase) do not depress synthesis of sucrose; AgNO<sub>3</sub> (an inhibitor for the flavoprotein enzyme systems) completely inhibits O<sub>2</sub> absorption, greatly depresses respiration, and completely inhibits sucrose synthesis. Clayton P. Holoway.

*Chem*  
**(3)**

SAFARIAN, M. and V. KOV., V.Ya.

USSR/Biology---Plants, Hybrid Phosphorus Exchange

"Exchange of Radioactive Phosphorus between the Graft and Wilding of a Hybrid Plant,"  
Inst. of Biochem. Imeni A.N. Bakh, Acad. Sci. USSR 3pp.

Dok. Ak. Nauk SSSR" Vol. LXX, No2. 1950.

Used isotopic method to study exchange of radio-active phosphorus between graft and mother plant in accordance with Michurin's principles. Shows phosphorus exchange is much more intensive in tissues and organs which are "physiologically" young. There is irregular phosphorus exchange between graft and wilding. Proves Michurin's conception of related exchange of material between graft and mother plant in vegetative hybridization. Submitted to Acad. A.I. Oparin 17 Nov. 1949.

CA

11A

Amino acid composition of plastid proteins. N. M. Sisakyan, R. N. Bezinger, and R. B. Kuvaleva (A. N. Bakht. Biochem. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 74, 987-90 (1950).—Sugar-beet plastid protein (isolated by pptn. with HCl at pH 4.4 from 0.3% NaOH in 60% EtOH) analyzed by partition chromatography after 24-hr. hydrolysis with N HCl gave the following compn. of amino acids: aspartic and glutamic acids, glycine, alanine, valine, leucine, serine, threonine, hydroxyproline, proline, tyrosine, phenylalanine, histidine, lysine, arginine, and creatine.  
G. M. Kosolapoff

SISAKYAN, N. M.

Science

Methods of determining vitamins; collection of articles on vitamins in biochemistry and physiology, Pod red N. M. Sisokiana i dr. Sb. 4). Moskva, Izd. inostr. lit. 1951.

9. Monthly List of Russian Accessions, Library of Congress, December 195~~7~~<sub>2</sub>, Uncl.

SISAKYAN, N. M.

Science

Fermentative activity of protoplasmic organisms. (Moskva), AN SSSR, 1951.

9. Monthly List of Russian Accessions, Library of Congress, November 195~~7~~<sub>2</sub>, Uncl.



11D

CA

Some metabolic properties of ramosse wheats. N. M. Siskayan, N. Vasileva, and A. Minina. *Zhurn. Obshch. Biol.* (J. Gen. Biol.) 12, 73-83(1951).—Ramosse wheats differ from common varieties in earlier synthesis of sucrose and starch, lower hydrolysis ratio, and lower content of sol sugars. 18 references. Julian P. Smith

CA

11A

Formation and movement of enzymes in living organisms.  
N. M. Sinsky and A. M. Kobryshova (Bakh. Biochem.  
Inst., Moscow). *Biochimica* 16, 222-7(1961); *cf. C.A.*

41, 5014. --The enzyme activities of invertase, phosphorylase, and phosphoglucosaminase were detd. in plastids--the enzyme depots of plants. The enzyme activity decreased in the leaf plastids and increased in the root leucoplasts of the sugar beet and potato during vegetation. A decrease in the enzyme activity was observed in the leucoplasts of potatoes and sugar beets during storage. These changes are ascribed to enzyme migrations. In heterotrophy, the enzymes move from the root to the leaf, whereas in autotrophy the enzyme movement is from the leaf to the root. H. P.

Inst. of Biochem. im. A. N. Bakh, Academy of Sciences, 155 R,  
moscow

SISAKYAN, N.M.; BIRYUZOVA, V.I.; KOBYAKOVA, A.M.

Changes in structure and enzymic activity of plastids in the ontogenetic development of the plant. Biokhimiya '51, 16, 449-452. (MLRA 4:10)  
(BA -AIII My '53:726)

69 112

The character of the changes of activity of respiratory enzymes during the process of the stepwise development of a plant. N. M. Simkyan and I. I. Filippovich. *Doklady Akad. Nauk S.S.S.R.* 76, 443-6 (1951).—Examn. of the enzymic systems of wheat and barley during winterizing and during the light phase of development revealed that during winterizing a noticeable increase of respiration occurs (max. in 46 days in wheat and 33 days in barley). Peroxidase and polyphenoloxidase are active in wheat, but no ascorbic acid oxidase is found; barley shows activity of all 3 enzymes. Cytochrome oxidase in wheat declines rapidly and vanishes in 6 days, and in 24 days in barley. In wheat the light phase leads to rapid rise of the 3 principal oxidases, a similar but somewhat smaller increase occurring in barley. Indications are that the light phase in itself is not responsible for the abrupt increase of oxidative activity, but rather is the result of the onset of the appropriate stage of plant development at that time. The nonwinterized specimens of barley all contain appreciable amts. of cytochrome oxidase.

G. M. Kosolapoff

# USSR - GERM

The nature of the substances which are formed during the process of aging wine brandies. N. M. Shukyan and I. A. Egorov. *Doklady Akad. Nauk SSSR* 79, 630-42 (1951); *Chem. Zentr.* 1952, 1585; *cf. C.A.* 42, 6069a; 48, 12369b. — High-quality wine brandy shows strong absorption in the ultraviolet, with a characteristic max. at 275-80 mμ. The substance responsible for this absorption is quantitatively adsorbed by activated C and can be extd. from the latter with ether. The substance isolated therefrom by sublimation was identified as vanillin. Since the latter is not present in unaged brandy, it must pass into the brandy from the wood of the oak cask during aging. Extns. with benzene, alc., and ether showed that a substance was present in oak wood which gave an absorption max. at 275-80 mμ. The specific aroma of the brandy, however, is regarded as the result of the interaction of this substance with other substances and alc. already present in the brandy. M. G. Moore /

SISAKYAN, N

M

EPP  
.R92993

PROBLEMA YEDINSTVA VNESHNEGO I VNUTRENNEGO V BIOLOGICHESKOM OBSHCHME VLSHCHESTV.

MOSKVA, IZD-VO ZNANIYE, 1952.

30 P. TABLE (VSESOUZNOYE OESHCHESTVO PO RASPROSTRANENIYU POLITICHESKIH I NAUCH-  
NYKH ZNANIY. 1952, SERIYA 2, NO. 46)

BIBLIOGRAPHICAL FOOTNOTES.

RUSSIA

Sibakyan N. M.

V Enzyme functions of plastids. N. M. Sibakyan (Acad.

MD Sci. U.S.S.R., Moscow). *Congr. intern. biochim., Résumés communs., 2<sup>e</sup> Congr., Paris 1952, 321*(in French).—A previous paper (cf. *C.A.* 47, 7008z) is supplemented. During heterotrophic growth, there is a strong flow of enzymes from the root plastids to the leaf plastids. When the leaves reach the autotrophic state, there is a reverse flow of enzymes towards the roots. Hybridization is associated with a change in the respiratory enzymes. Types of enzymes found in plastids are enumerated.

W. C. Tobie

OPARIN, A.I.; SISAKYAN, N.M.; GEL'MAN, N.S.

Contribution to the history of plant biochemistry in the U.S.S.R. Trudy  
Inst.ist.est. 4:236-266 '52. (MIRA 6:7)

(Botanical chemistry)



SISAKYAN, N. M.

14476 AEC-tr-2461  
TYPES OF UNION OF ENZYMES WITH THE PROTEIN  
COMPLEX OF PLASTIDS. N. M. Sisakyan and A. M.  
Kobakova. Translated by Eugenia Arischwager from  
Biokhimiya 17, 368-75(1952). 14p.

2

Instit. of Biochem. in. A. N. Bakh of the Academy  
of Sciences USSR, Moscow

1. SHAKYAN, H. M., SHAKYAN, S. A., SHAKYAN, Ye. N.
2. USSR ( )
4. Proteins.
7. Chemical and electrochemical properties of plastid proteins. Biochimia 17 no. 5. '52.

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

SISAKYAN, N.M.

Tasks of biochemistry according to resolutions of the 19th Congress of  
the Communist Party of the Soviet Union. Biokhimiia, Moskva 17 no. 5, 1952, 111  
Sept-Oct 1952. (CML 25:1)

SISAKYAN, N.M.;BRONOVITSKAYA, Z.S.;DEMYANOVSKAYA, N.S.

Resistance of vitamin C in preserved dehydrated vegetables and potatoes.  
Biokhimiia, Moskva 17 no.6:701-703 Nov-Dec 1952. (CML 25:1)

1. Institute of Biochemistry imeni A. N. Bakh of the Academy of Sciences  
USSR, Moscow.

1. SISAKYAN, N. M., Prof.
2. USSR (600)
4. Enzymes
7. Problems of enzymology. Vest. AN SSSR 22 No. 8, 1952.

9. Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

1. SISKYAN, N. M.: VASIL'YEVA, N. A.
2. USSR (600)
4. Hybridization, Vegetable
7. Biochemical changes in morphologically invariable vegetative hybrides.  
Dokl. AN SSSR 86 no. 5 1952

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SISAKYAN, N.M.:BEZINGER, Ye.N.:KUBAYEVA, Ye.B.

Excretion of protein from plastids and its characteristics. Doklady  
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SISAKYAN, N.M.:CHERNYAK, M.S.

Nucleic acids in plastids. Doklady Akad. nauk SSSR 87 no. 3:469-470  
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1. Presented by Academician A. I. Oparin 4 September 1952.



SISAKYAN, N.M., chlen-korrespondent.

[Metabolism in plants] Obmen veshchestv v rastitel'nom organisme. Moskva,  
Izd-vo "Znanie," 1953. 31 p. (MIRA 6:12)

(Plants--Metabolism)

1. Akademiya nauk SSSR.

SISAKIAN, N. M.

Aktywnosc enzymatyczna struktur protoplazmatycznych. Warszawa, Panstwowe Wydawn.  
Rolnicze i leśne, 1953. 74 p. (Enzymatic activity of protoplasmic structures.  
Tr. from the Russian) DA Not in DLC Poland

SO: MONTHLY INDEX OF EAST EUROPEAN ACCESSIONS (EEAI) LC, VOL. 7, NO. 1, JAN. 1958

Sisakyan, N. M.

Jan 53

USSR/Chemistry - International Congress

"Second Biochemical Congress in Paris" By V. A. Engel'gardt, Corr Mem Acad Sci and V. N. Bukin, Professor.

Vest Ak. nauk, SSSR, No 1, 1953, pp 75-77

Second Biochemical Congress was held in Paris in 1952. The following Soviet scientists were in the Soviet delegation: Acad A. I. Oparin (Leader of the delegation), Corr Mem ACAD Sci V. A. Engel'gardt, Prof A. N. Belozerskiy, V. N. Bukin, V. N. Butrov, V. N. Orekhovich. Following Russian Papers were read: By Oparin "The Change of Action of Enzymes in Plant Cells under the influence of external effects", by Orekhovich "Procollagens, their chemical compositions, properties and biological role", by Engel'gardt "The Enzymology of Myosin", by Belozerskiy "The Antigen fractions of bacteria of the intestinal group", by Bukin "Proteid Compounds of fat-soluble vitamins". Also 3 papers of scientists who did not attend: by Acad A. V. Palladin "Research on the Biochemistry of the Cerebrum", by Corr Mem Acad Sci Kh. S. Koshtoyants "The role of the active groups of Protein substances in the Process of Nerve Regulation" and by Dr Biol Sci N. M. Sisakyan "The Enzymatic Function of Plastids".

271T8

SISAKYAN, N. M.

Biochemical problems in developing a scientific basis for viticulture. N. M. Sisakyan. *Biotekhn. Vinodeliya, Sbornik* 4, 7-31 (1963).—Analytical methods used previously were on a macroscale. The biochem. activity of substances present in wine in microquantities play an important role in the development of the character of wine. Wines prepd. by 4 different methods were analyzed for free amino acids (I) (by ninhydrin), amines (II) (by Van Slyke), and peptides. Chromatographic analyses for amino acids were also used. During vigorous fermentation, amounts of I and II increase at the expense of the nitrogenous materials of yeast cells. All amino acids in grape must, with the exception of proline, are used by the yeast during the first 5-6 days of fermentation. Acids found over a 4-month period were glutamic, aspartic, glycine, alanine, valine, serine,  $\gamma$ -aminobutyric, leucine, and proline. Thirty-six samples of wine examd. showed 400-1800  $\gamma$ /l. vitamins B<sub>1</sub> and B<sub>2</sub>. Traces of nicotinic acid were also found. The amt. of vitamins present decreases with age of wine and depends upon the grape variety used. S. B. Radding

Physiobiochemical features of the development of sherry film and its use in production. N. M. Sisakyan, E. M. Popova, N. F. Sienko, M. A. Gerasimov, and M. G. Puchkova. *Biokhim. Vinodeliya, Sbornik 4*, 33-55 (1953).— Investigation of biochem. processes of viniculture shows that there is a decrease in the wine of the vitamins of group B, suggesting that the vitamins are used by the yeast cells in the nature of an addnl. factor of nutrition. Previous observations have shown that the microorganisms of yeast are capable of absorbing vitamins from the surrounding media. Studies were made of (1) microbiol. observations on the intensity of growth and the development of sherry film and its morphological changes at the time of processing wine nitrogenous and bioactive substances; and (2) the biochem. and chem. processes underlying sherry formation. Results of the first tests show that the most favorable conditions for the development of the film is displayed by the mediums in which there has been the addn. of 0.5% yeast autolysis processed at a temp. of  $-180^{\circ}$ , 120 mg./l. ammonia N, and 0.4 mg./l. riboflavin. The amts. of aldehydes, and specifically acetal, are considerably increased in comparison with the control. A second set of tests was performed to eliminate the necessity of the  $-180^{\circ}$  temp. Wines were treated at  $-180^{\circ}$ ,  $-40^{\circ}$ ,  $-10^{\circ}$  (with a 5-fold

freezing and thawing technique); and holding at  $48^{\circ}$  for 48 hrs. Yeast in the control sample and in the heated sample generated very slowly. The best activity was noted with  $-180^{\circ}$  treatment with the activity decreasing with an increase in temp. After the treatment a rapid increase in the activity of esterase and peroxidase is noted. After preliminary lab. expts., tests were made in 5 large vats containing (A) control wine, (B) wine + 0.5% maceration juice, (C) wine + 0.5% yeast autolysis product processed at a temp. of  $-180^{\circ}$ , (D) wine + 80 mg./l. ammonia N, (E) wine + 120 mg./l. ammonia N. All were carefully mixed and inoculated with a layer of sherry yeast No. 90. The condition of the plasma cells were noted at different stages of development of the film. The most rapid growth was observed in (C) and (E). During the first 60 days, the amt. of alc. decreases with the greatest decrease being shown by (B). A decrease in sugar and total and volatile acids is noted with an increase in aldehydes. It is possible to cause sherry formation by introducing to the original wine material other wine material rich in extractable substances, bioactive compounds in the form of maceration juice (I) or yeast autolysis product. Investigations indicate that the greatest effect is obtained by the addn. of I in combination with ammonia. S. B. Radding

SISAKYAN, N.M.

The chemical mechanism of the maturing of brandy spirits. N. M. Sisakyan and L. A. Egorov. *Biokhim. Khimicheskiy Zhurnal* 17:129-131 (1973). Maturing of brandy goes through two stages: the first stage is characterized by a gradual increase in the content of substances resulting in the interaction of the brandy with the oak tar. The second stage appears to be the partial decomposition of the substances accumulated during ripening. A substance, which appears characteristic of high-grade brandy, during fractional distillation of brandy remains in the bottoms, is sol. both in the brandy and in ether, is not pptd. with lead acetate, is catalyzed contrary to distd.  $H_2O$ , and gives a characteristic qual. reaction as an aldehyde. By means of paper chromatography and sublimation under vacuum, vanillin and ethylvanillin were isolated. A group of substances extd. from oak staves give max. absorption at 280  $m\mu$  which is characteristic of quality brandy. This gives rise to the assumption that in the process of extg. brandy there results an interaction with the oak staves which in the following treatment is converted into vanillin and ethylvanillin and other compounds, giving brandy its characteristic aroma.

S. B. R. diling.

SISAKYAN, N.M.; FILIPPOVICH, I.I.

Character of metabolism in phasic development of the organism. *Zhur.ob.*  
biol. 14 no.3:215-228 My-Je '53. (MLBA 6:6)  
(Plants--Metabolism) (Growth (Plants))

SISAKYAN, N.M.; KUVAYEVA, Ye.B.

Metabolism of cavernous fluids of the silkworm in the process of metamorphosis. Biokhimiia 18 no.3:354-362 My-Je '53. (MLBA 6:7)

1. Institut biokhimii im. A.N.Bakha AN SSSR, Moskva. (Silkworms)



SISAKYAN N.M.

Chemical Abst.  
Vol. 48 No. 8  
Apr. 25, 1954  
The Fermentation Industries

Changes in the amino-acid composition of wine in the primary fermentation period. N. M. Sisakyan and L. N. Bezinger (Bakh Inst. Biochem. Acad. Sci. U.S.S.R., Moscow). *Biokhimiya* 18: 412-22 (1953). *Saccharomyces ellipsoideus* was the fermenting agent. Test samples were taken from the mid layers of the fermenting must consisting of the pure grape juice. Samples were filtered through asbestos and heated in boiling water for 20-30 min. Microscopic examn. indicated freedom from yeast cells. Filtration and heating did not affect amino acids and peptides. Quant. chem. and partition paper chromatographic tests were employed. The yeasts manifested a selective assimilation of amino acids, making little use of proline in the early days of the fermentation. Amino acids and their derivs., other than those originally present, were formed later from the N substances of the yeast cells which liberate aspartic, glutamic, and  $\alpha$ -amino fatty acids, alanine, valine, leucine, glycine, serine, and threonine. Combined amino acids and their free homologs were found in the wine simultaneously.

B. S. Levine

SISAKYAN, N.M.<sup>M</sup>, professor, chlen-korrespondent [redaktor]; PROSTOSERDOV, N.N.  
[reviewer].

"Biochemistry of wine making." N.M.Sisakian, ed. Reviewed by N.N.Prostoserdob.  
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(Wine and wine making) (Sisakian, N.M.)

SISAKYAN, N.M.; KRASNOVSKIY, A.A.; MIKHAYLOVA, Ye.S.; BRIN, G.P.

Interrelation of photochemical capacity and enzymatic processes. Biokhimiia  
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1. Institut biokhimiim.A.N.Bakha Akademii nauk SSSR, Moscow.  
(Photosynthesis) (Enzymes)

SISAKYAN, N. M.

Interrelation of the processes of metabolism. N. M.  
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(1953).--A review with 29 references. E. H.

SISAKYAN, N. M.

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USSR/Biology - Proteins of Plastids Nov/Dec 53

"The Nature of the Protein Complex of Plastids,"  
N.M. Sisakyan, Moscow

Usp Sov Biol, Vol 36, No 3 (6), pp 332-345

The author gives a detailed account of his investigations on the physical chemistry of the protein complex of plastids. He describes its structure, composition, and development. He maintains that relationships between the various component parts of the protein complex change in response to environmental influences, and illustrates this by reporting his observations on

273T4

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such changes among the proteins, enzymes, and nucleic acids present in plastids. The article is illustrated by graphs and pictures.

273T4

SISAKYAN, N. M.

Chem Abs.

V. 48 25 Jan 54

Biological Chem.

✓ Change of the amino acid content of proteins of plastids in the process of life of an organism. N. M. Sisakyan, E. N. Resinger, and N. A. Gumilevskaya. Doklady Akad. Nauk S.S.S.R. 91, 907-10 (1953); cf. ibid. 80, 117 (1952).

C.A. 47, 3994c.—In addn. to the previously found 17 amino acids in sugar-beet leucoplast protein (I), an 18th one is reported, isoleucine. A protein was isolated similarly from the beet-leaf chloroplasts; this contained 11.9% N. The protein isolated, as mentioned above, from the leucoplasts was compared with the protein (II) obtained by pptn. of an EtOH ext. with Me<sub>2</sub>CO; this protein contained 10.3% N. II contains less arginine, leucine and isoleucine, threonine, and serine than I; II contains more lysine and glutamic acid than I. Cystine is almost absent in II. I behaves as a homogeneous substance in electrophoresis; II appears to be a mixt. Examn. of specimens from plants of different age showed the following. Age has no effect on aspartic and glutamic acids, alanine, and arginine in I, but serine, valine, tyrosine, leucine, isoleucine, and lysine decline, and threonine and cystine rise. Thus, age appears to effect structural changes in the protein character. G. M. Kosolapoff

Inst. Biochem. in. A. N. Bach, AS USSR

OSKANYAN, N.M.

Age variations of tannin content in varieties of grapes.  
N. M. Sisakyan, I. A. Egorov, and B. L. Afrisyan. *Biokhim.*  
*Vinodstvo, Akad. Nauk S.S.S.R. Seriya 1*, 158-60 (1954).—  
The sherry varieties of grapes show 2 max. of tannin content  
in the leaves with an intervening min. at the beginning of  
ripening, when the tannins begin to flow into the berries.  
Water-sol. tannins decline in the seeds as ripening proceeds.  
The nonsherry grapes show a single max. of tannins which  
appears generally before ripening; the drop of tannins in  
these grapes in the leaves and berries is accompanied by a  
rise of tannins in the seeds. Both chem. and spectropho-  
tometric methods were used. G. M. Kosolapoff

OPARIN, A.I.; SISAKYAN, N.M.; KURSNAOV, A.A.; SEVERIN, S.Ye.

Vladimir Aleksandrovich Engel'gardt; on his 60th birthday. Izv. AN  
SSSR. Ser. biol. no.6:125-126 N-D '54. (MLRA 8:3)  
(ENGEL' GARDT, VLADIMIR ALEKSANDROVICH, 1894- )



SISAKYAN, N. M.

The enzyme activity of the cyclophorase system of chloroplasts. N. M. Sisakyan and I. M. Mosolova (A. H. Bakh Inst. Biochem. Acad. Sci. U.S.S.R., Moscow). *Bio-khimiya* 19, 485-9 (1954).—The purpose was to det. the presence of the cyclophorase system in isolated chloroplasts. Isolated chloroplasts of the leaves of the sugar beet are capable of oxidizing intermediary products of the tricarboxylic cycle into  $H_2CO_3$  and  $H_2O$ . This indicates that in green vegetables there is present a complex of enzymes of the cyclophorase system. These complexes are concd. primarily in the chloroplasts. The activity of separate members of the system is of unequal intensity, which may be related to the differences in the intensity of the accompanying enzymic processes and changes in the concn. of the acids of the tricarboxylic cycle in the process of the development of the organism. B. S. Levine

SISAKYAN, N. M.

USSR.

1. Oxidation-reduction processes in hard and soft wheat. N. M. Sisakyan and N. A. Vasil'eva (A. N. Bakh Inst. Biochem., Acad. Sci. U.S.S.R., Moscow). *Biokhimiya* 19, 730-7 (1954).—Respiration and oxidation-reduction processes are enhanced in hard and soft wheat in the germination stage, the levels of their intensity being higher in the germs than in the endosperms. In the first 24 hrs. of germination the germ plays the most important role in the transport of H. After 24 hrs. the part played by the endosperm in the process of dehydrogenation becomes considerably intensified. Different types of dehydrogenase are found in both the germ and the endosperm. Citric and malic dehydrogenases are most active in the germ and glutamic and succinic dehydrogenases in the endosperm. During the first 3 days of germination soft wheat displays a more intense process of respiration, reaching a max. on the 2nd day; the constitution of its oxidation-reduction system pattern is different from that of hard wheat. The final stages of biol. oxidation in soft wheat are accomplished by ascorbic acid oxidase, polyphenol oxidase, and peroxidase. In the hard wheat during the first 24 hrs. citric acid oxidase is the functioning enzyme; it is replaced on the 2nd day by ascorbic acid oxidase and polyphenol oxidase. B. S. L.

SISAKYAN, N.M.

Principal results of the scientific activity of the Academy of  
Sciences of the U.S.S.R. during 1953. Vest. AN SSSR 24 no.3:23-42  
Mr '54. (MLRA 7:3)

1. Chlen-korrespondent Akademii nauk SSSR.  
(Academy of Sciences of the U.S.S.R.) (Science)

SISAKYAN, N. M.  
USSR/Biochemistry

Card 1/1

Authors : Sisakyan, N. M; Bezinger, E. N; Garkavi, P. G., and Kivman, G. Ya.

Title : Simple method determining amino-acids through chromatographic analysis on paper.

Periodical : Dokl. AN SSSR, 96, Ed. 2, 343 - 346, May 1954

Abstract : Determination of amino-acids is carried out by a two-dimensional chromatographic method. The initial process of separation is accomplished with the aid of methyl alcohol - water - pyridine (40 : 10 : 2) and the second and final process with n-butyl alcohol - methylethylketone - water - diethylamine (20 : 20 : 10 : 2). The solvents require no preliminary purification. The appearance of amino-acid on the paper is attained by treating the latter in a 0.4-% ninhydrin solution in methyl alcohol, in acetone or n-butyl alcohol. One reference. Table, photos.

Institution : Acad. of Scs. USSR, The A. N. Bakh Inst. of Biochemistry and the State Control Inst. of Serums and Vaccines at the Ministry of Health USSR.

Submitted : March 13, 1954

SISAKYAN, N. M.

USSR/Biology      Biochemistry

Card                : 1/1

Authors            : Sisakyan, N. M., Memb. Corresp. of Acad. of Sc. USSR, and Odintsova, M. S.

Title               : Changes in ribonucleic acid of plastidae in the process of organism development

Periodical         : Dokl. AN SSSR, 97, Ed. 1, 119 - 120, July 1954

Abstract           : The changes in ribonucleic acid taking place in chloroplastidae and leukoplastidae during the process of organism development, were investigated. Results are given in tables. Eight references: 5 USSR, 2 USA and 1 German.

Institution        : ....

Submitted          : May 6, 1954

SISAKYAN, N. M.

USSR/ Biology - Biochemistry

Card : 1/1

Authors : Sisakyan, N. M., Memb. Corres. of Acad. of Sc. USSR, and Smirnov, B. P.

Title : Bond forms between lipoids and protein complex of plastides

Periodical : Dokl. AN SSSR, 97, Ed. 3, 487 - 489, July 21, 1954

Abstract : Scientific data on the bond forms, existing between lipoids and the protein complex of plastides, are presented. The form of inter-metabolisms of various lipoids during the development of the organism was investigated to determine the chemical nature and the biochemical functions of plastides. Four USSR and 2-German references. Table, graph.

Institution : Acad. of Sc. USSR, The A. N. Bakh Institute of Biochemistry

Submitted : May 18, 1954

SISAKYAN, N. M.

USSR/Chemistry - Biochemistry

Card 1/1 : Pub. 22 - 29/44

Authors : Sisakyan, N. M., Memb. Corresp. of Acad. of Sc. USSR; Bezinger, E. N.;  
and Kivkutsan, F. R.

Title : Amino-acid composition of phycoerythrin

Periodical : Dok. AN SSSR 98/1, 111-114, Sep 1, 1954

Abstract : The amino-acid composition of phycoerythrin (chromoprotein) derived from *Callithamnion rybosum* algae and containing 10.61% of N per dry weight, was investigated. The amino-acids were identified by the method of distributive chromatography on paper. The results obtained are shown in tables. Sixteen references: 8-USA; 3-German and 5-USSR (1928-1954). Tables; drawings; illustrations.

Institution : Acad. of Sc. USSR, The A. N. Bakh Institute of Biochemistry

Submitted : June 11, 1954

SISAKYAN, N.M.

[Biochemical properties of plastids; reports and papers of the  
Third International Congress of Biochemistry, Brussels, 1-6 August,  
1955. Biokhimicheskie svoistva plastid; soobshchenia i doklady na  
III Mezhdunarodnom biokhimicheskom kongresse, Briussel', 1-6 avgusta  
1955 g. Moskva Izd-vo Akad. nauk SSSR, 1955. 36 p. [Parallel  
texts in Russian and French]. (MIRA 11:6)  
(PLASTIDS)]



SISAKYAN, N. F.

"On the Nature of Changes in Metabolism Under Irradiation Effects," a paper  
presented at the Atoms for Peace Conference, Geneva, Switzerland, 1955

SISAKYAN N.M.

✓ Application of carbon-14 and phosphorus-32 in studies of the synthetic functions of isolated chloroplasts. N. M. Sisakyan. *Sessiya Akad. Nauk S.S.S.R. po Atomnoi i Yadrovoy Energii* 1955, *Zashchita Otdel. Biol. Nauk*, 172-82 (English summary, 183).—The use of labeled mols. permitted the establishment of participation of isolated chloroplasts in a no. of plant functions, such as incorporation of  $C^{14}$ -glycine and glycylglycine into the protein compn., synthesis and oxidation of fatty acids, and introduction of P into phospholipides.  $C^{14}$ -labeled acetate is incorporated into the fatty acid content of the chloroplasts and adenosinetriphosphate does not affect this process. Incorporation of P into phospholipides occurs only in the presence of adenylic acid. 16 references. G. M. K.

USSR/General Division. Congresses. Sessions. Conferences. A-4

Abs Jour : Ref Zhur-Biologiya, No 3, 1958, 9309

APPROVED FOR RELEASE: 08/23/2000

CIA-RDP86-00513R001550910018-1"

Author : N. M. Sisakyan

Inst :

Title : Some Problems of Radiobiology (on the Results of the International Conference for the Peaceful Use of Atomic Energy)

Orig Pub : Vestn. AN SSSR, 1955, No 12, 43-51

Abstract : Account of reports on the biological action of radiation in connection with its use in special problems: sterilization of food products; control of pests and parasites; application of radiation in agriculture; utilization of the method of marked atoms in biology and agriculture. See RZhBiol., 1956, 93484.

Sisakyan, H.M.

MD ✓ The amino acid composition of the proteins of chloroplasts and leucoplasts in plant ontogenesis. N. M. Sisakyan, B. N. Bezinger, N. A. Gumiilevskaya, and N. F. Lukyanova (A. N. Bakht Inst. Biochem., Acad. Sci. U.S.S.R., Moscow). *Biokhimiya* 20, 368-76 (1955).—Study material consisted of roots and leaves of the sugar beet. Procedures are described for obtaining the plastids and for the separ. and analysis of the proteins. Paper chromatographic methods were extensively employed. A lipoprotein was isolated at various stages of the sugar beet growth, having 4.8-6.7% of lipides depending upon the age of the plant. By means of partition chromatography 18 constituent amino acids were found in this protein: asparagine, glutamine, glycine, alanine, valine, leucine, isoleucine, serine, threonine, tyrosine, phenylalanine, proline, arginine, lysine, cystine, and methionine. In the leucoplastids quant. detns. were made of 13 and in the chloroplastids of 8 amino acids. Characteristic of the isolated plastid proteins is a high content of basic amino acids (arginine, lysine). The oxyamino acids and in some stages of the plant's development the S-contg. amino acid content of the leucoplast protein is also high. The amino acid content of this protein varies with the age of the plant. While the content of serine may be reduced by 6.8%, the content of cystine, threonine, and glycine may be increased by a total of 7.1%, possibly through the interconversion of some of these amino acids. The leucine content of sugar beet roots is notably reduced with age. The content of dicarboxylic amino acids, alanine, and arginine remains unchanged. It is noteworthy that in the chloroplast protein the amino acids which fluctuate quantitatively were identical with those of the leucoplasts which remained quantitatively const. (aspartic acid, alanine) and vice versa (serine, cystine, glycine). The arginine content of both proteins remained unchanged at all stages of the sugar beet growth. B. S. Levine (2)

SISAK (M), N.M.

BELOZERSKIY, A.N.,

"Biochemistry of metabolism". N.M.Sisakian. Reviewed by  
A.N.Belozerskii. Biokhimiia, 20 no.4:511-512 J1-Ag '55.  
(METABOLISM) (SISAKIAN, N.M.) (MLRA 8:12)

KURSANOV, A.L., akademik; SISAKYAN, N.M.

The 8th international botanical congress. Vest. AN SSSR 25 no.4:57-65  
Ap '55. (MIRA 8:7)

1. Chlen-korrespondent AN SSSR (for Sisakyan)  
(Paris—Botany—Congresses)

*SISAKYAN, N. M.*

USSR/ Biology - Conferences

Card 1/1 Pub. 124 - 7/25

Authors : Sisakyan, N. M., Memb. Corres., Acad. of Sc., USSR, and Kuzin, A. M., Prof.

Title : Certain problems of radiobiology

Periodical : Vest. AN SSSR 25/12, 43-51, Dec 1955

Abstract : Minutes are presented from the International Conference on peacetime utilization of atomic energy held during August 8-20, 1955, in Geneva, Switzerland. Various problems of radiobiology and its applications are discussed. One USSR reference (1950).

Institution : .....

Submitted : .....

SISAKIAN, N.M.

RUBIN, B.A.

The biochemistry of metabolism." N.M.Sisakian. Reviewed by  
B.A. Rubin. Usp.sovr.biol.40 no.1:125-128 J1-Ag '55.(MLRA 8:10)  
(METABOLISM) (SISAKIAN, N.M.)

*Sisakyan, N. M.*

USSR/ Biology - Biochemistry

Card 1/1      Pub. 22 - 36/49

Authors : Sisakyan, N. M., Memb. Corresp., Acad. of Sc., USSR; and Veynova, M. K.

Title : ~~XXXXXXXXXXXX~~  
The nature of albumina of the nodule liquid of cocoons of mulberry silkworm (Bombyx Mori)

Periodical : Dok. AN SSSR 101/3. 531-534, Mar 21, 1955

Abstract : An investigation was conducted for the purpose of explaining the nature of albumina of the nodule liquid of a mulberry silkworm and estimation of their quantitative changes during the process of development. The study was carried out by means of an electrophoretic analysis and the results obtained are described. Four references: 1 USSR and 3 French (1946-1954). Tables; graphs.

Institution : Acad. of Sc., USSR, The A. N. Bakh Inst. of Biochemistry

Submitted : January 1, 1955



SISAKYAN, N.M.

USSR/ Biology - Biochemistry

Card 1/1 Pub. 22 - 42/62

Authors : Sisakyan, N. M., Memb. Corresp., Acad. Sc., USSR, and Filipovich, I. I.

Title : ~~Synthesis of albumin in isolated chloroplasts~~  
Synthesis of albumin in isolated chloroplastics

Periodical : Dok. AN SSSR 102/3, 579 - 582, May 21, 1955

Abstract : The conditions favorable for the synthesis of albumin in isolated chloroplastics were investigated and results are described. Fourteen references: 6 English, 1 French and 7 USSR (1935-1954). Tables, graph.

Institution : Acad. of Sc., USSR, The A. N. Bach Inst. of Biochem.

Submitted : March 19, 1955

SISAKYAN, Norayr Martirosovich, professor, doktor biologicheskikh nauk;  
~~BENYUMOV~~, O.M., redaktor; FURMAN, G.V., tekhnicheskiiy redaktor

[Modern concepts of metabolism] Soveremennye predstavleniya o  
biologicheskoy obmene veshchestv. Moskva, Izd-vo "Znanie," 1956.  
29 p. (Vsesoiuznoye obshchestvo po rasprostraneniyu politicheskikh  
i nauchnykh znaniy. Ser. 3. no.33) (MLRA 9:9)

1. Chlen-korrespondent AN SSSR (for Sisakyan).  
(METABOLISM)

GEL'MAN, N.S.; ZENKEVICH, G.D.; SISAKYAN, N.M., otvetstvennyy redaktor;  
OPARIN, A.I., akademik, redaktor; KHRUSHCHOV, G.K., redaktor;  
GENKEL', P.A., professor, redaktor; GAYSINOVICH, A.Ye., kandidat  
biologicheskikh nauk, redaktor; SIMKINA, Ye.N., tekhnicheskii  
redaktor

[Biochemistry of plants; a bibliography of Russian literature, 1738-  
1952] Biokhimiia rastenii; bibliograficheskii ukazatel' otechestven-  
noi literatury, 1738-1952. Sost. N.S.Gel'man i G.D.Zenkevich. Otv.  
red. N.M.Sisakian. Moskva, 1956. 394 p. (MLRA 9:7)

1. Akademiya nauk SSSR. Otdeleniye biologicheskikh nauk. 2. Chlen-  
korrespondent AN SSSR (for Sisakyan, Khrushchov)  
(Bibliography--Botanical chemistry)

SISAKYAN, N. M.

Chemical nature and biochemical functions of plastids.  
N. M. Sisakyan. *Izvest. Akad. Nauk S.S.S.R., Ser. Biol.* 1956, No. 6, 32-40; cf. *Chem. Abstr.* 50, 12144e. — Detailed review, without annotated references through 1955. The general summary of available data indicates that the protein component of chloroplasts contains: 2 nucleoproteins which contain ribonucleic acid, 2 proteins different in precipitability by  $(NH_4)_2SO_4$ , which belong to the globulin group and are termed chromoglobulins, and a complex of nucleoproteins with substances of polysaccharide type on one hand and with globulins on the other hand. *Ibid.* No. 6, 3-18. — This review includes synthesis of peptides in chloroplasts, nucleic acids of plastids, lipids of plastids, and synthesis of high-energy bonds in plastids. G. M. Kosolapoff

SISAKYAN, N.M.

Chemical nature and biochemical functions of plastids. Izv. AN SSSR.  
Ser.biol. no.6:3-18 N-D '56. (MLA 10:1)

1. Institut biokhimii imeni A.N.Bakha Akademii nauk SSSR.  
(CHROMATOPHORNS)

*Sisakyan, N.M.*

A-3

USSR/General Section - Scientific Institutions

Abs Jour : Referat Zhur - Biol. No 16, 25 Aug 1957, 67872

Author : Sisakyan, N.M.  
Title : The Biochemical Laboratories of Belgium and France

Orig Pub : Vestn. AN SSSR, 1956, No 10, 61-67

Abstract : In the Belgian laboratories there is being studied phototropism, photoperiodism in plants, its biochemical mechanism, optimal conditions for artificial growth of crops, changes in amino acid metabolism as a factor in adaptation, initial shifts in the organism under the influence of radiation, and the end results of this influence, etc. Broad studies were carried out in biochemistry of germination and maturation, and in the field of cellular biochemistry, etc. There was noted the clear organization and high degree of automation in the work of the laboratories. The French biochemists are working on problems of sulfur metabolism and its relation to the metabolism of

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Card 1/2

Sisakyan, N. M.

2  
✓ The localization of cytochrome oxidase in the plant cell.  
N. M. Sisakyan and I. P. Filippovich (A. N. Bakh Inst.  
Microchem. Acad. Sci. U.S.S.R., Moscow). *Biokhimiya* 21,  
1037 (1950). -- In the isolated chloroplasts of the tobacco  
leaf the presence of actively functioning cytochrome oxidase  
(I) was demonstrated. Repeated washing of the chloro-  
plast fraction with energetic phosphate soln. considerably  
enhanced the activity of I. It was found in all fractions of  
the tobacco-leaf homogenates, except in the supernatant re-  
sulting from centrifugation at 22,000 r.p.m. The highest  
activity of I was found in the fraction of chloroplast sedi-  
mented by centrifugation at 550 r.p.m. This fraction also  
contained the major part of the chlorophyll. The detn. of  
the activity of I must be made in the presence of diethyl-  
dithiocarbamate, which prevents the accumulation of qui-  
nones and their inhibiting effect upon the activity of I.  
B. S. Levine

SISAKYAN, N. M.

The synthesis and oxidation of fatty acids in isolated chloroplasts. N. M. Sisakyan and B. P. Smirnov (A. N. Bakh Inst. Biochem., Acad. Sci. U.S.S.R., Moscow). *Biokhimiya* 21, 273-8 (1956).—The study materials were: red clover, sunflower, sugar beet, and beans. Lipide analyses were made on chloroplasts isolated by method I and chloroplasts from the leaves of bean sprouts to be used for fatty acid oxidation studies were isolated by method II of S and S (C.A. 50, 12196i). For the study of the synthesis of fatty acids whole chloroplasts were isolated from the cotyledons of sunflower sprouts and from the leaves of bean sprouts. The vegetable material was ground in a porcelain mortar with a K phosphate buffer of pH 6.0 in 0.3M soln. of sucrose. At pH 6.0 the nuclei disintegrated thereby facilitating the isolation of the free chloroplasts. The homogenate was pressed through linen cloth, slowly centrifuged 4 times for 3 min. to separate the cell fragments and the starch granules, or it was filtered through a No. 1 or No. 2 glass-filter. The supernatant was then centrifuged at 700 g for 5 min. to bring down the chloroplasts. Sediment was again resuspended in K phosphate buffer of pH 7.0 and again centrifuged at 700 g. The chloroplasts thus isolated constituted 20% of the total of the plant material used. They were examined by electron microscope and cytologically. Lipids were extd. from the chloroplasts by the method of S. and S. (C.A. 48, 13829i); fatty acid detns. in the lipids were made by a generally accepted method. Acetate with  $C^{14}$  in the carboxyl group was employed in the study of fatty acid synthesis. Fatty acids constitute an av. of 50% of the lipid substances of the chloroplasts. During the incubation of chloroplasts isolated from the cotyledons of sunflower sprouts with

acetone having  $C^{14}$  in the carboxyl group the inclusion of  $CH_3CO_2H$  into the fatty acids of the chloroplast lipids was demonstrated. The inclusion of labeled acetate into the chloroplast lipids of bean sprouts under similar conditions was not observed. Chloroplasts possess the capacity to oxidize higher fatty acids: linoleic, linolenic, oleic, and palmitic. In the bean chloroplasts were found 2.1 units of coenzyme A or 5.1  $\gamma$  of coenzyme A/g. of dry substance. — B. S. Levine

USSR/Physiology of Plants. Photosynthesis.

I-2

Abs Jour: Ref. Zhur-Biol., No 1, 1958, 1135.

Author : Melik-Sarkisyan, S.S., Sisakyan, N.M.

CIA-RDP86-00513R001550910018-1"

Inst : Institute of Biochemistry of the Academy of Sciences USSR

Title : The Nature of Chloroplast Albumins

Orig Pub: Biokhimiya, 1956, 21, No 3, 329-339.

Abstract: In the Institute of Biochemistry of the Academy of Sciences USSR the proteins  $\alpha$ ,  $\beta$ ,  $\gamma$  and  $\delta$  were isolated from the leaf chloroplasts of the fourth rosette of sugar beet. The  $\alpha$  component comprises  $\approx 25\%$  of the whole protein system of the chloroplast; the complex  $\beta$ ,  $\gamma$  comprises from 45% to 60%; the  $\delta$  component 23.30% [sic]. The  $\alpha$ -component is a complex albumen containing nucleic acid and tightly connected with the  $\delta$  component. The  $\delta$  component is a complex of albumen and polysaccharides, containing a series of amino acids,

Card : 1/2

-22-

-23-

SISAKYAN, N. M.

USSR Plant Physiology. Respiration and Metabolism.

No 68033



USSR / General Biology. Physical and Chemical Biology

B-1

Abs Jour : Ref Zhur - Biol., No 1, 1958, No 194

Author : Sisakyan, N.M., Gumilevskaya, N.A.

Inst : Not Given

Title : On the Transformation of Nucleic Acids in the Metamorphosis  
Process of the Mulberry Silkworm.

Orig Pub : Biokhimiya, 1956, 21, No 6, 810-815

Abstract : During the metamorphosis period of the mulberry silkworm a mineralization of P occurs in the chrysalis (C), which reaches its maximum on the 5th day of development (change of histolysis by histogenesis); analogous manifestations are observed in the cavity fluids (CF) of the chrysalis. The content of nucleic acids in C and CF increases at the beginning of greater histolysis and in the period of differentiation, which coincides with an increase in desoxyribonucleic acid DNA content, while the content of ribonucleic acid RNA at first grows markedly and then gradually decreases from the beginning of histolysis

Card : 1/2

SISAKYAN, N.M.

~~biochemical laboratories in Belgium and France.~~ Vest. AN SSSR  
26 no.10:61-67 0 '56. (MLRA 9:11)

1. Chlen-korrespondent Akademii nauk SSSR.  
(Belgium--Biological laboratories)  
(France--Biological laboratories)

SISAKYAN, N. M.

Certain fundamental problems of modern biochemistry.  
N. M. Sisakyan. *Uspehi Sovremennoi Biol.* 41, 117-43  
(1956).—A review of the papers read at the 3rd International  
Biochemical Congress held in Brussels in 1955. J. A. S.

SISAKYAN-N.M.

Paths of synthesis of phospholipides in chloroplasts in vitro. N. M. Sisakyan and B. P. Smirnov (A. N. Bakh Biochem. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 107, 440-51(1956).—Synthesis of phospholipides in kidney-bean chloroplasts was followed by means of  $P^{32}$  tracer *in vitro*, after isolation of chloroplasts by particulation of leaves in aq. sucrose and centrifuging. The chloroplasts were incubated in soln. of  $Na_2HP^{32}O_4$  for desired periods, and the action was stopped by  $CCl_3CO_2H$ . Examn. of phospholipide fraction showed that its content varies during the day, being max. during daylight hours; acid-sol. P also follows this pattern. No introduction of  $P^{32}$  into phospholipide fraction took place on incubation of chloroplasts with  $Na_2HPO_4$  alone. Addn. of adenylic acid, di-K succinate, glycerol, and  $Na_2HP^{32}O_4$ , however, resulted in incorporation of  $P^{32}$  in 2 hrs. Adenylic acid was found to be the essential component of the mixt. for this reaction.

G. M. Kosolapoff

SISAKYAN, A. A.  
GABRIELIAN, A. A.

"The Role of Structural Elements in the Biochemical Function of the Cell,"  
a paper presented at the International Symposium on the Origin of Life, Moscow,  
19-24 Aug 1957.

SISAKYAN, N.M.; BEZINGER, E.N.

Relation of amino acids and their derivatives to the qualitative  
features of wine. Biokhim. vin. no.5:7-26 '57. (MLRA 10:6)

1. Institut biokhimii im. A.N. Bakha AN SSSR.  
(Wine and wine making--Analysis)  
(Amino acids)

SISAKYAN, N.M.; KALACHEVA, V.Ya.

Effect of X-irradiation on protein synthesis in rye sprouts [with summary in English]. Biofizika 2 no.4:480-482 '57. (MLRA 10:9)

1. Institut biokhimi im. A.N.Bakha Akademii nauk SSSR, Moskva  
(X RAYS—PHYSIOLOGICAL EFFECT)  
(RYE) (PROTEINS)

SISAKYAN, N.M.; FILIPPOVICH, I.I.

Protein synthesis in isolated structures of plant cells [with  
summary in English]. Biokhimiia 22 no.1/2:375-384 Ja-F '57.

(MLRA 10:7)

1. Institut biokhimiia im. A.N.Bakha Akademii nauk SSSR, Moskva.  
(PLANTS, metabolism,  
protein synthesis in vitro (Rus))  
(PROTEINS, metabolism,  
plant synthesis in vitro (Rus))



SISAKYAN, N.M.; KOPYAKOVA, A.M.

Lipoxidases in isolated plastids [with summary in English].  
Biokhimiia 22 no.3:516-522 My-Je '57. (MIRA 10:11)

1. Institut biokhimii im. A.N.Bakha Akademii nauk SSSR, Moskva.  
(OXIDASES,  
lipoxidases in isolated plastids (Rus))

*Sisakyan N.M.*  
SISAKYAN, N.M.

Visiting the biochemists of Great Britain. Biokhimiia 22 no.3:  
611-614 My-Je '57. (MIRA 10:11)  
(GREAT BRITAIN--BIOCHEMISTRY--RESEARCH)

SISAKYAN, N.M.; KUBAYEVA, Ye.B.

Characteristics of protein synthesis in the coelomic fluid of silkworms (*Bombyx mori* L.) [with summary in English]. *Biokhimiia* 22 no.4:686-694 J1-Ag '57. (MIRA 10:11)

1. Institut biokhimii im. A.N.Bakha AN SSSR, Moskva.

(MOTHS,

*Bombyx mori*, proteins synthesis in coelomic fluid (Rus))

(PROTEINS, metabolism,

*Bombyx mori*, synthesis in coelomic fluid (Rus))

SISAKYAN N. M

USSR/General Biology - Physical and Chemical Biology.

B.

Abs Jour : Ref Zhur - Biol., No 21, 94516

Author : Sisakyan, N.M., Vasil'yeva, N.A., Spiridonova, G.I.

Inst :

Title : Isolation of Nuclei from a Vegetative Cell and the Study of Their Properties.

Orig Pub : Biokhimiya, 1957, 22, No 5, 813-824.

Abstract : Nuclear and cytoplasmic fractions from the seed buds of hard and soft wheat were obtained in a saccharosephosphate buffer and in organic solvents by Berens' double solvent method. With the separation of the saccharose in the solution, judging by the loss of the dehydrase activity, the soluble proteins are lost, which during isolation in the solvents the free lipoids are washed out. In the fractions isolated by means of differential centrifugation in the solvents, the nuclei differ from the cytoplasm by a lower content of usual and protein N. In the nuclear

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SISAKYAN, N. M.

✓ Ribonuclease of sprouting wheat grain. N. M. Sisakyan,  
N. A. Vasil'eva, and N. H. Konstantinov. Dokl. Akad.  
Nauk SSSR 112: 300-2 (1957). 4. Summary in: C.A. 49.  
1957. 112: 300-2 (1957). 4. Summary in: C.A. 49.  
1957. 112: 300-2 (1957). 4. Summary in: C.A. 49.

SISAKYAN, N.M.; BEKINA, R.M.; MOSOLOVA, I.M.

Cyclophorase activity of the structural elements of  
vegetable cells. Dokl. AN SSSR 112 no.3:481-484 Ja '57. (MLRA 10:4)

1. Chlen-korrespondent AN SSSR (for Sisakyan).  
(Cyclophorase) (Plant cells and tissues)

AUTHOR: SISAQYAN, N.M., KUVAYEVA, Ye.B. ~~20-4-43/61~~ 20-4-43/61  
 TITLE: The Influence Exercised by Energy Donors and inhibitors upon the  
 Inclusion of C<sup>14</sup>-Glycine in the Albumen of the Cavity Liquid  
 of the Silkworm.  
 PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 4, pp 873 - 876  
 (U.S.S.R.)  
 ABSTRACT: When investigating the chemism of the processes of metamorphosis  
 the greatest attention is paid to albumin transformation. It was  
 shown that the processes occurring on the occasion of metamorphosis  
 are caused by fermentative processes. Here at first the oxidation  
 reactions are slowed down. This leads to an increase of the re-  
 ducing processes in the hemolympha. The latter again activates  
 the effectiveness of the proteolytic ferments. Now the authors  
 have demonstrated that the proteolytic activity of the body  
 cavity liquid of a silkworm does not remain constant during the  
 process of metamorphosis. In the stage of decay of the larval  
 organs a distinct proteolysis is observed. At the beginning of  
 histogenesis (formation of the organs of the butterfly) it is  
 relieved by a fall of the proteolytic activity and by a jerky  
 increase of the albumin nitrogen. The latter phenomenon takes  
 place at the expense of the decrease of the non-nitrogen albumin.  
 The authors connect these dislocations in the mutual relation of  
 the single nitrogen forms with the intensified albumin synthesis

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The Influence Exercised by Energy Donors and Inhibitors 20-4-43/61  
upon the Inclusion of C<sup>14</sup>-Glycine in the Albumen of the Cavity  
Liquid of the Silkworm. ~~incorporation~~

of enzymes was interrupted by adding 20% trichloro acetic acid (TChE), so that the final concentration was brought up to 9%. The incorporation capacity for glycine C<sup>14</sup> is low towards the end of the 25 - 30% cocoon period, whereas it amounts 8 times as much in the period of histogenesis (30 - 65% of the cocoon period). Adding Saccherose only causes an increase of incorporation by 47%, whereas in histogenesis it increases by more than 3 times as much. The causes are the following: 1) Saccherose can have a stabilizing effect by preserving those structures which are necessary for the synthesis of albumin; 2) the energy liberated by the oxidation of saccherose can be used for synthesis processes. The influence of ATP<sub>H</sub> is especially strong on the reaction environments, probably because of the lack of energy necessary for the synthesis of oxidation systems at that moment. The results on the inhibition of th glycine C<sup>14</sup> incorporation into the body cavity proteins give evidence of a connection existing between the oxidizing phosphorylation and the synthesis of albumin. An entirely different impression is obtained when adding NaF. In the stage of hystolysis it has an inhibiting effect, whereas in the histogenesis no delay becomes noticeable. On the contrary, it

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SISAKYAN, N. M.

"The Particularity of Protein Synthesis in Plant and Animal Cells."

paper to be presented at 2nd UN Intl.' Conf. on the peaceful uses of Atomic Energy, Geneva, 1 - 13 Sept 58.

SISAKYAN, N. M.      Moscow    (USSR)

"The Peculiarities of Krebs' Cycle in the Plant Cell."

report submitted IV Intl. Cong. of Biochemistry, Vienna, 1 - 6 Sep 1958.

PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON ENZYME CHEMISTRY, Tokyo & Kyoto, 1  
 AUTHOR: Organizing Committee, International Symposium on Enzyme Chemistry, Tokyo  
 Maruzen, 1958.

## Synthesis of the Peptide Bond in Structural Units of the Cell

N. M. Sissakian

Baku Institute of Biochemistry, Academy of Sciences, Maxam. 1-55 R

Investigation of the chemistry of peptide bond formation has shown that the several structural units of the well in isolated systems possess different capacities of incorporating radioactive tracers into their products.

The work of many investigators has shown that the majority of macromolecules in animal cells are located in the cytoplasm. The sedimentation characteristics of these macromolecules in sucrose gradients as you can see, are very similar to the sedimentation characteristics of the macromolecules obtained from the homogenate by means of differential centrifugation. The sedimentation characteristics of the macromolecules were not found to be different in experiments *in vitro* when the macromolecules were isolated from the homogenate (isolated from the mitochondria, microsomes) or when they were isolated from the homogenate. These results are included separately, together with the results of the sedimentation experiments.

Thus, for example, in Dekker's investigation (16), it was shown that maximum incorporation of a radioactive amino acid into the proteins takes place in the case of the homogenate and the microsomes, and not in the case of the mitochondria and the mitochondria. In the case of the homogenate, the incorporation of the amino acid was partially replaced by a non-proteinaceous substrate, which was not found in the case of the mitochondria and the mitochondria. In the case of the mitochondria, the incorporation of the amino acid was not replaced by a non-proteinaceous substrate, but in the case of the mitochondria, the incorporation of the amino acid was not replaced by a non-proteinaceous substrate.

These results show that the majority of the macromolecules which form the protein synthesis machinery are located in the cytoplasm. This is in agreement with the results of the sedimentation experiments, which show that the majority of the macromolecules which form the protein synthesis machinery are located in the cytoplasm. This is in agreement with the results of the sedimentation experiments, which show that the majority of the macromolecules which form the protein synthesis machinery are located in the cytoplasm.

In all these investigations, the reduction of peptide bonds in the incorporation of labeled amino acids into the proteins of isolated structural elements of the cell was the work of other authors. Attempts were made to study the synthesis of proteins in separate cell structures by other methods, for example, by determination of the increase in potassium amylose. Indeed, according to Khorvash's analysis, the synthesis of this protein is effaced in large light granules, while the participation of factors produced by mitochondria, the participation of factors produced by microsomes, and the participation of factors and Minsky [10], and of Zhorbits [11] showed that certain conditions the radioactive tracer is incorporated in *in vitro* also into the proteins of cell nuclei; thus,

The field of protein synthesis in the structures of animal cells a certain amount of evidence has been obtained which brings us closer to recognizing the laws of this process. But these data do not yet enable us to draw final conclusions as to the facilitation of protein synthesis in animal cells. Our knowledge is much more scanty with regard to the mechanism of protein synthesis in the plant cell. In many respects, however, it is similar to that in the animal cell. It was shown that plant cells are capable of culturing the synthesis of small peptides and small proteins and the incorporation of labelled amino acids into the structures of these structures.

The possibility of peptide synthesis by plants was studied in our laboratory [4]. It was found that the direct combination of evolution plasticity and its manifestation in enzymes, while when the right conditions

and there takes place a rapid rise in enzymatic activity of the plastids. Thus, the conversion of leucoplasts into chloroplasts which takes place under conditions of darkness is accompanied by intensification of the properties of these structures (1). Several other (antheroxera, phytoerythra, (1); Deleun-Gremont, (1); others) also obtained indirect evidence for the parts of chloroplasts in protein synthesis.

It was seen found in our Laboratory (7) that the isolated chloroplasts of a young plant at different enzymatic systems participating in the synthesis of peptide bonds. One system effects the formation of peptide bonds by way of a transpeptidation reaction. The other catalyzes the direct synthesis of protein from free amino acids. Later Pleschke and Ivanko (8) found *in vivo* experiments that sulphur-methionine is incorporated at the highest rate in the synthesis of a fraction consisting of chloroplasts and *Chlorella*, with preponderance of chloroplasts.

Several difficulties arise in elucidating the metallopeptide bond formation and of metal protein binding to the discrepancies noted sometimes between data on incorporation of isotopic tracers into the peptide and the changes in the amount of protein measured by other procedures.

other biochemical methods. In our laboratory (5, 6) it was established that the cohesiveness liquid of silkworm pupae there takes place during the period of histogenesis an increase in protein content at the expense of non-protein nitrogen, and a simultaneous increase of the rate of glycine incorporation in the synthesis of protein. The cohesiveness liquid it should be more correct to call it an experiment with modified structures obtained from the cohesiveness liquid of silkworm pupae at different stages of histogenesis. Microphotographs showed that the fraction composed of the cohesiveness liquid and microtubules exhibited the highest concentration of radioactivity. It is interesting to note that the incorporation of the radioactive tracer into the protein of the cohesiveness liquid takes place in the period of histogenesis. However, the incorporation of the radioactive tracer into the protein of the cohesiveness liquid of silkworm pupae takes place in the period of histogenesis.

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1000 JOURNAL OF CLIMATE

SISAKYAN, N. M.

In the Department of Biological Sciences

30-58-5-14/36

Vest Ak Nauk SSSR, No. 5, p. 60-62, 1958

the importance of an increase in contact of biology with chemistry.

3) G. K. Khrushchov, Corresponding Member, Academy of Sciences, USSR and a number of other speakers also spoke on the necessity of strengthening the contacts between biologists and physicists as well as chemists. He called it an essential disadvantage that the office of the department in its activity mainly restricted to scientific-organizational problems, which was supported by several other speakers.

4) A.A. Imshenetskiy, Corresponding Member, Academy of Sciences, USSR, advocated the opinion that the office of the department should take up everything new in science and that it should act as initiator in the posing of new principal scientific problems. He made the proposal to introduce prize competitions for the best works.

5) E. A. Asratyan, Corresponding Member, Academy of Sciences, USSR emphasized the one-sided development of physiology in the country and stated that neurophysiology is developed to a very limited extent.

6) N. M. Sisakyan, Corresponding Member, Academy of Sciences, USSR emphasized the necessity of creating connections between the scientific institutions of the department and the councils

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30-58-5-14/36

In the Department of Biological Sciences

of national economics. In his closing speech V. A. Engel'gardt Member, Academy of Sciences, USSR agreed to the remarks made by the speakers of the discussion. The plenary assembly elected a new composition of the office. Beside the Secretary V.A. Engel'gardt, Member, Academy of Sciences, USSR whose powers have not yet expired the following persons were elected: The Members, Academy of Sciences, USSR, A. L. Kursanov, Ye. N. Pavlovskiy, V. N. Sukachev, and I. V. Tyurin, as well as the Corresponding Members, Academy of Sciences, USSR E. A. Asratyan, P. A. Baranov, V. A. Kovda, Yu. A. Orlov, A. N. Svetovidov, S.Ye. Severin, G. K. Khrushchev, V. N. Chernigovskiy. The following lectures were heard: M. N. Meysel' on new directions in the fluorescence-microscopic investigation of cells, tissues and organs. B. P. Ushakov on the problem of the adaptation of the cells of cold-blooded animals to raised temperatures. M.N. Livanov on the investigation of higher nervous activity by the new electro-physiological method. M. A. Peshkov on the use of the perfected an-  
optical microscope in microbiology and protistology. I. S. Beritashvili, Member, Academy of Sciences, USSR showed a popular scientific film on the investigation of the part played by the cerebral cortex of the cerebrum and cerebellum in the spatial orientation of animals.

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30(7)  
AUTHOR:

Sisakyan, N. M., Corresponding Member,  
AS USSR

SOV/30-59-11-27/48

TITLE:

Soviet Scientists on the Exposition (Sovetskiye uchenyye  
o vystavke)

PERIODICAL:

Vestnik Akademii nauk SSSR, 1958, Nr 11,  
pp 100 - 102 (USSR)

ABSTRACT:

In the Palace of Sciences of the Brussels World Exposition biology plays a leading role. Thanks to the use of the most recent techniques of experimentation as well as by collective work great strides have been made in the field of cell research. The Soviet biologists presented exhibits from the following fields: work in the field of photosynthesis; the study of the mechanism of muscular reaction and the microstructure of nerve-fibers; and the effect of ferments and the movement of materials in plants. Furthermore, the section **Viruses, Bacteriophagous Organisms, and Bacteria** was very impressive. The history of this branch was illustrated, from the very first studies undertaken

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Soviet Scientists on the Exposition

SOV/30-50-11-27/48

in this field by the Russian scientist D.I. Ivanovskiy, to this day. Moreover, the new Soviet electron microscope ~~U.S.C.~~ -100 with a resolving power of between 10 and 15 Å was exhibited. The author regrets that too little or no attention was given in the Soviet exhibits to the work done by Soviet scientists in the fields of antibiotics, albumin, and such fields of biology as genetics, virology and radiobiology. In contrast with a number of other countries the Soviet Union also failed in showing the cooperation between Soviet biologists, chemists, and physicists. There is 1 figure.

Card 2/2

SISAKYAN, N.M., MELIK-SARKISYAN, S.S., FRENKEL, S.Ya.

Certain physicochemical properties of chloroplast proteins.  
[with summary in English]. Biokhimiia 23 no.5:723-736 S-0 '58  
(MIRA 11:11)

1. Institut biokhimii imeni A.M. Bakha. AN SSSR (Moskva) i  
Institut vysokopolimernykh soyedineniy AN SSSR (Leningrad).  
(PROTEIN, determ.  
in chloroplasts (Rus))  
(CHLOROPHYLL,  
chloroplasts, determ. of proteins (Rus))



SISAKYAN, N.M., PINUS, Ye.A.

Mitochondrial influence on glycolysis [with summary in English].  
Biokhimiia 23 no.6:904-908 N-D '58 (MIRA 11:12)

1. Institut biokhimii imeni A.N. Bakha AN SSSR, Moskva.  
(MITOCHONDRIA)  
(GLYCOLYSIS)

SEMENOV, N.N., akademik; ARBUZOV, A.Ye., akademik; MAMEDALIYEV, Yu.G.;  
KARGIN, V.A., akademik; TITOV, N.G., doktor khim.nauk; OBOLENTSEV,  
R.D., doktor khim.nauk; IMSHENETSKIY, A.A.; SISAKYAN, N.M.

Discussion of the report. Vest. AN SSSR 28 no.8:19-26 Ag '58.  
(MIRA 11:9)

1. Chlen-korrespondent AN SSSR (for Mamedaliyev, Imshenetskiy,  
Sisakyan).

(Chemistry, Organic--Synthesis)

4. Absorption and translocation of mineral elements (applied to the leaves of plants). I I ~~Shubert~~, and G V ~~Shubert~~, USSR Academy of Sciences, Moscow.
5. Protein synthesis under the conditions of an adverse water balance. I I ~~Shubert~~, A N ~~Shubert~~ Institute of Biochemistry, Academy of Sciences, USSR, Moscow.
6. The role of oxidative enzymes in the ripening and storage of fruits. I I ~~Shubert~~, A N ~~Shubert~~ Institute of Biochemistry, Academy of Sciences, USSR, Moscow.
7. Dependence of mineral composition of plants on the environmental conditions. M I ~~Shubert~~, Academy of Sciences USSR, Moscow.
8. Introduction of topics at seminar on growth substances and their action. A P ~~Shubert~~, and I I ~~Shubert~~, V L ~~Shubert~~ Institute of Biochemistry, Academy of Sciences, USSR, Leningrad.
9. Isotopic acids and plant metabolism. V G ~~Shubert~~, Institute of Biochemistry, Academy of Sciences USSR, USSR.
10. The state of cytochrome oxidase in the nucleus and age changes in the plant cell. V G ~~Shubert~~, I I ~~Shubert~~, I I ~~Shubert~~, A P ~~Shubert~~, and I I ~~Shubert~~, Institute of Biochemistry, Academy of Sciences, USSR, Leningrad.
11. Biochemical properties of plant cell nuclei. I I ~~Shubert~~ and I I ~~Shubert~~, A N ~~Shubert~~ Institute of Biochemistry, Academy of Sciences USSR, Moscow.
12. Interrelationships between respiration and photosynthesis. D V ~~Shubert~~, V L ~~Shubert~~ Institute of Biochemistry, Academy of Sciences USSR, Leningrad.
13. Quinones other than cytochrome oxidase in plants. P A ~~Shubert~~, A N ~~Shubert~~ Institute of Biochemistry, Academy of Sciences, USSR, Moscow.
14. On translocation problems. V I ~~Shubert~~, Institute of Plant Physiology, Leningrad, USSR.
15. Freezing effect of microorganisms on the resistance of plants to adverse conditions. M Y ~~Shubert~~, Academy of Sciences, USSR, Leningrad.
16. Application for chemical synthesis of substances and organic reproductive substances for in diagnosis of health of plants on crops. V I ~~Shubert~~, L'Académie des Sciences de l'URSS, Moscow.
17. Peculiarities of the changes of physiological processes in plants associated with frost hardiness. I I ~~Shubert~~, I I ~~Shubert~~, I I ~~Shubert~~, I I ~~Shubert~~, A I ~~Shubert~~, and M V ~~Shubert~~, V L ~~Shubert~~ Institute of Biochemistry, USSR, Leningrad.
18. Photosynthesis in trees. I I ~~Shubert~~, Laboratory of Light Physiology, Leningrad, USSR.
19. The vegetation of natural grasslands of the USSR. I I ~~Shubert~~, Leningrad.
20. The ecology of fertilization in flowering plants. I I ~~Shubert~~, I I ~~Shubert~~, Botanical Institute, Academy of Sciences, USSR, Leningrad.
21. The correlation between the concepts "forest ecosystem" and "forest biocenosis" and their importance for the classification of forests. I I ~~Shubert~~, Forest Institute, Academy of Sciences USSR, Moscow.

Report submitted but not presented at the 1st. Botanical Congress, Montreal, Canada, 1959, Aug 1960.

